



## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. FAA-2022-0889; Project Identifier AD-2021-00614-T; Amendment 39-22373; AD 2023-05-04]

RIN 2120-AA64

#### Airworthiness Directives; The Boeing Company Airplanes

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for all The Boeing Company Model 787-8, 787-9, and 787-10 airplanes. This AD was prompted by reports of ram air turbine (RAT) pump barrel assembly failures, which caused the RAT to fail to provide hydraulic power. The failures were determined to be caused by variations in the bronze metal used during manufacturing, which can result in varying fatigue properties. This AD requires an inspection or records review to determine the part number of the RAT pump and control module (PCM) and of the RAT assembly, and replacement of any RAT PCM or any RAT assembly having certain part numbers. This AD also prohibits the installation of affected parts. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:**

*AD Docket:* You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2022-0889; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

*Material Incorporated by Reference:*

- For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110–SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website [myboeingfleet.com](https://myboeingfleet.com).

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2022-0889.

**FOR FURTHER INFORMATION CONTACT:** Douglas Tsuji, Senior Aerospace Engineer, Systems and Equipment Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone: 206-231-3548; email: [douglas.tsuji@faa.gov](mailto:douglas.tsuji@faa.gov).

**SUPPLEMENTARY INFORMATION:****Background**

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to all The Boeing Company Model 787-8, 787-9, and 787-10 airplanes. The NPRM published in the *Federal Register* on September 21, 2022 (87 FR 57653). The NPRM was prompted by reports of RAT pump barrel assembly failures, which caused the RAT to fail to provide hydraulic power. The failures were

determined to be caused by variations in the bronze metal used during manufacturing, which can result in varying fatigue properties. In the NPRM, the FAA proposed to require an inspection or records review to determine the part number of the RAT PCM and of the RAT assembly, and replacement of any RAT PCM or any RAT assembly having certain part numbers. In the NPRM, the FAA also proposed to prohibit the installation of affected parts. The FAA is issuing this AD to address fatigue or cracking of the RAT hydraulic pump bronze cylinder block. This condition, if not addressed, could cause failure of the RAT pump and subsequent loss of backup hydraulic power for the flight controls, which can result in loss of continued safe flight and landing.

### **Discussion of Final Airworthiness Directive**

#### **Comments**

The FAA received comments from the Air Line Pilots Association, International (ALPA) who supported the NPRM without change.

The FAA received additional comments from United Airlines (UAL), who supported the NPRM and also had additional comments, and from Boeing. The following presents the comments received on the NPRM and the FAA's response to each comment.

#### **Request to Revise a RAT Assembly Part Number**

Boeing requested that paragraphs (j)(1) and (2) of the proposed AD be revised to specify RAT assembly part number (P/N) 7000011H08, instead of P/N 700011H08.

The FAA agrees with the commenter's request to fix this typographical error and has revised paragraphs (j)(1) and (2) of this AD accordingly.

#### **Request to Revise the Applicability**

Boeing requested that the proposed AD be revised to specify that it applies only to the airplanes identified in Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021, instead of all Model 787-8, 787-9, and 787-10 airplanes. Boeing claimed that Model 787 airplanes delivered after the incorporation of

CN-AA82746B were configured with the current version of the RAT assembly and PCM. Boeing added that, by design and process, there are no alternative installation configurations permitted either in production or in service.

The FAA disagrees with the commenter's request. As stated in the NPRM, the FAA considers the RAT PCMs and RAT assemblies to be rotatable parts, and has determined that these parts could later be installed on airplanes that were initially delivered with acceptable RAT PCMs and RAT assemblies, thereby subjecting those airplanes to the unsafe condition. The FAA acknowledges there is a low possibility that airplanes delivered with the latest parts have had those parts replaced, but the possibility does exist. The FAA has not changed this AD regarding this issue.

#### **Request to Clarify Related AD**

UAL requested clarification of how the requirements of AD 2016-07-25, Amendment 39-18470 (71 FR 21720, April 13, 2016) (AD 2016-07-25) impact the requirements of the proposed AD. UAL noted that Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021, provides an alternative method of compliance (AMOC) for AD 2016-07-25 to incorporate Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021, on aircraft in the applicability of AD 2016-07-05.

The FAA agrees to clarify. AD 2016-07-25 will not affect this AD. AD 2016-07-25 requires changes to the RAT assembly's volume fuse to address potential failure of the RAT pump at low speeds. AD 2016-07-25 requires installation of a new RAT assembly, P/N 7000011H08, with a compliance time of within 36 months after May 18, 2016. This AD requires replacing any RAT assembly having P/N 7000011H08 with P/N 7000011H09. The RAT assembly P/N 7000011H09 incorporates the previous volume fuse changes and the new pump barrel changes. The AMOC to AD 2016-07-25 associated with Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB Issue

002, dated October 26 2021, essentially allows installation of the RAT assembly having P/N 7000011H09 in lieu of P/N 7000011H08. The FAA has not changed this AD regarding this issue.

### **Conclusion**

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

### **Related Service Information under 1 CFR Part 51**

The FAA reviewed Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021. This service information specifies procedures for replacing any RAT PCM having part number (P/N) 7001267H06 with P/N 7001267H07, and replacing any RAT assembly having P/N 7000011H08 with P/N 7000011H09. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

### **Costs of Compliance**

The FAA estimates that this AD affects 148 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

#### **Estimated costs for required actions**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Inspection or records review	1 work-hour X \$85 per hour = \$85	\$0	\$85	\$12,580

### Estimated costs for optional actions

Action	Labor cost	Parts cost	Cost per product
Replace RAT PCM	5 work-hours X \$85 per hour = \$425	Up to \$95,210	Up to \$95,635
Replace RAT assembly	5 work-hours X \$85 per hour = \$425	Up to \$680,912	Up to \$681,337

### Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA’s authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency’s authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and

(3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

#### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

#### **The Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

#### **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

**2023-05-04 The Boeing Company:** Amendment 39-22373; Docket No. FAA-2022-0889; Project Identifier AD-2021-00614-T.

#### **(a) Effective Date**

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

#### **(b) Affected ADs**

None.

#### **(c) Applicability**

This AD applies to all The Boeing Company Model 787-8, 787-9, and 787-10 airplanes, certificated in any category.

#### **(d) Subject**

Air Transport Association (ATA) of America Code 29, Hydraulic power.

#### **(e) Unsafe Condition**

This AD was prompted by reports of ram air turbine (RAT) assembly failures, which caused the RAT to fail to provide hydraulic power. The failures were determined

to be caused by variations in the bronze metal used during manufacturing, which can result in varying fatigue properties. The FAA is issuing this AD to address fatigue or cracking of the RAT hydraulic pump bronze cylinder block. This condition, if not addressed, could cause failure of the RAT pump and subsequent loss of backup hydraulic power for the flight controls, which can result in loss of continued safe flight and landing.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Inspection**

For airplanes with an original airworthiness certificate or original export certificate of airworthiness issued on or before the effective date of this AD: Within 60 months after the effective date of this AD, inspect the RAT pump and control module (PCM) and the RAT assembly to determine the part number. A review of airplane maintenance records is acceptable in lieu of this inspection if the RAT PCM and the RAT assembly part numbers can be conclusively determined from that review.

**(h) Replacements**

If, during the inspection required by paragraph (g), any RAT PCM having part number (P/N) 7001267H06 or any RAT assembly having P/N 7000011H08 is found: Except as specified by paragraph (i) of this AD, at the applicable times specified in the “Compliance” paragraph of Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021.

Note 1 to paragraph (h): Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin B787-81205-SB290039-00, Issue 002, dated October 26, 2021, which is referred to in Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021.

**(i) Exception to Service Information Specifications**

Where Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021, uses the phrase “the Issue 001 date of Requirements Bulletin B787-81205-SB290039-00 RB,” this AD requires using “the effective date of this AD.”

**(j) Parts Installation Prohibition**

(1) For airplanes with an original airworthiness certificate or original export certificate of airworthiness issued after the effective date of this AD: Installation of a RAT PCM, part number (P/N) 7001267H06, or RAT assembly, P/N 7000011H08, is prohibited as of the effective date of this AD.

(2) For airplanes with an original airworthiness certificate or original export certificate of airworthiness issued on or before the effective date of this AD, installation of a RAT PCM, P/N 7001267H06, or RAT assembly, P/N 7000011H08, is allowed until the actions required by paragraph (h) of this AD are accomplished.

**(k) Credit for Previous Actions**

This paragraph provides credit for the actions specified in paragraph (h) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 001, dated November 3, 2020.

**(l) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in

paragraph (m)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

**(m) Additional Information**

(1) For more information about this AD, contact Douglas Tsuji, Senior Aerospace Engineer, Systems and Equipment Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone: 206-231-3548; email: douglas.tsuji@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (n)(3) and (4) of this AD.

**(n) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Alert Requirements Bulletin B787-81205-SB290039-00 RB, Issue 002, dated October 26, 2021.

(ii) [Reserved]

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110–SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website [myboeingfleet.com](http://myboeingfleet.com).

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov), or go to: [www.archives.gov/federal-register/cfr/ibr-locations.html](http://www.archives.gov/federal-register/cfr/ibr-locations.html).

Issued on March 5, 2023.

Christina Underwood, Acting Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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